

22 of the specification).

As a result of studying the above problem, the present inventors found that it is possible to produce a soybean protein having satisfactory gelation ability **and** satisfactory emulsification ability according to the process of the present invention (page 7, lines 19-22 of the specification).

Generally, heating is carried out **after** transglutaminase treatment for deactivation of the enzyme. A skilled person in the art would not feel the necessity for heating before the transglutaminase treatment. In fact, a skilled person in the art would not carry out heating before the transglutaminase treatment from the viewpoint of work efficiency.

(2) R1

The object of R1 is to recover the solubility of denatured soybean meal or flakes (column 2, lines 41-43 of R1).

The Examiner asserts that R1 discloses that the heat treated protein has high emulsification ability and gelling performance (page 3, paragraph 6 of the Official Action).

However, R1 discloses that:

"When the protein materials are produced from defatted soybean flakes denatured by superheating treatment in accordance with the method of this invention, they have **almost the same** gel-forming ability and emulsifying ability as those of protein materials produced from undenatured defatted soybean flakes (column 3, lines 48-53, emphasis added)".

That is, R1 does not disclose obtaining a soybean protein that has **more** emulsifying ability than conventional soybean protein by a heat treatment.

(3) R2

The Examiner asserts that R2 discloses that soybean protein material can be reacted with transglutaminase to produce powdered soy milk; that the process disclosed by R2 comprises mixing the soybean protein and transglutaminase and heating for the formation of a cross-linked product (page 3, paragraph 8 of the Official Action); and that R2 discloses that the reaction product of transglutaminase and soybean protein will have high nutrition value, good taste and smoothness of texture (page 3, paragraph 9 of the Official Action).

However, the Examiner misunderstands R2 in some respects.

First, "powder soy milk" in R2 is not "powdered soy milk", but is "soy milk made from soy flour" as shown in paragraph [0010] of R2. That is, R2 describes smoothness of texture of "powder soy milk" in the liquid form. In addition, R2 describes that smoothness of texture of "powder soy milk" which is made from soy flour is improved, but that the improved "powder soy milk" is the same as conventional soy milk from which okara is removed (paragraph [0040] of R2). That is, R2 only discloses a process of producing a drinkable "powder soy milk" by transglutaminase treatment. At least, the improvement of the texture of soy milk does not suggest the improvement of the texture of a meat product.

Second, the raw material of R2 is not "soybean protein" but is "soy flour". "Soy flour" contains fat-and-oil and okara (tofu lees) which are removed in the process for producing the conventional defatted soy milk. It is well known that okara has an excellent property in the point of nutrition, but that okara gives only foods having a rough and poor taste even when a small amount thereof is incorporated into other food material (for example, see column 1, lines 19-31 of the attached copy of US 5,786,021). That is, **the high nutrition value of R2 is from okara, and the transglutaminase treatment of R2 is used for improving the texture of okara** (paragraphs [0011], [0032] and [0040] of R2).

(4) R3

R3 discloses a process combining transglutaminase and **raw fish material** comprising soybean protein and water. It is clear that this material comprises fish protein. R3 discloses that **fish protein and soybean protein** are subjected to a transglutaminase treatment. Therefore, R3 does not disclose or suggest a process of producing a **soybean protein**.

(5) Combination of the references

As explained above, the raw material of R2 is soy flour which contains fat-and-oil and okara in the point of nutrition. It is clear that the transglutaminase treatment of R2 is used for improving the texture of okara. On the other hand, the raw material of R1 is denatured, defatted soybean flake material. The soy flour is clearly different from the defatted soybean in the food industry because soy flour contains oil-and-fat and therefore it is necessary to prevent oxidization of the fat-and-oil during the treatment process thereof. Therefore, a skilled person in

the art would not be motivated to combine R1 and R2.

In addition, the raw material of the present invention is soybean protein from which okara is removed. The protein containing okara does not have enough gelation ability and emulsification ability. Thus, R2 is not relevant to the present invention, and R2 would teach away from the present invention.

Further, R1 only discloses protein materials having **almost the same** gel-forming ability and emulsifying ability. R2 only discloses the transglutaminase treatment for improving the texture of okara, and does not suggest the improvement of the texture of a meat product. R3 does not disclose a process of producing a **soybean protein**. Therefore, even if these references were combined, a skilled person in the art could not predict the effect of the present invention that the soybean protein which is subjected to heat treatment and then the transglutaminase treatment improves the texture of a meat product.

Moreover, R3 discloses that **fish protein and soybean protein** are subjected to a transglutaminase treatment. Even if all three references were combined, a skilled person in the art could not predict the effect of the present invention that the texture of a meat product can be improved only by adding a soybean protein. This has the excellent effect that the cost and production equipment are reduced because the transglutaminase treatment is unnecessary at the stage of processing the final meat product.

For these reasons, Applicants take the position that the presently claimed invention is clearly patentable over the applied references.

Therefore, in view of the foregoing remarks, it is submitted that the rejection of the claims has been overcome, placing the application in condition for allowance. Such allowance is solicited.

Respectfully submitted,

Hiroyuki KATO et al.

/Michael R.

Digitally signed by /Michael R. Davis/
DN: cn = /Michael R. Davis/, o = WLP,
ou email = mrdavis@wlp.com,
c=US
Date: 2011.03.23 12:15:01 -0400

Davis/

By

Michael R. Davis

Registration No. 25,134

Attorney for Applicants

MRD/clw
Washington, D.C. 20005-1503
Telephone (202) 721-8200
Facsimile (202) 721-8250
March 23, 2011